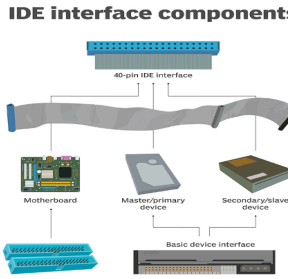
**What is IDE (Integrated Drive Electronics)?**
IDE (Integrated Drive Electronics) is an electronic interface standard that defines the connection between a bus on a computer's motherboard and the computer's disk storage devices. The IDE interface was originally based on the IBM PC Industry Standard Architecture 16-bit bus standard, but it has since been implemented in computers that use other bus standards.

**Origin**
In November 1990, the American National Standards Institute (ANSI) standardized the IDE technology, referring to it as Advanced Technology Attachment (ATA). The ATA standard is maintained by the T13 Committee of the International Committee on Information Technology Standards, an ANSI-accredited forum for creating technology standards.
The IDE technology was developed in the 1980s by Western Digital and Compaq as part of an effort to combine the storage controller and drive into a single device. After ANSI standardized the technology, the terms ATA and IDE started to be used interchangeably. Since then, it has become a generally accepted practice to treat them as one in the same, even if it could be argued that they are not.

**What is an IDE interface?**
An IDE interface is an industry-standard adapter for connecting IDE devices and enabling them to communicate with each other. At one time, most computers included at least one IDE interface built into the motherboard. The interface provided a 40-pin connector for attaching an IDE hard disk drive (HDD) to the computer. A flat ribbon cable connected the drive to the motherboard by attaching to the IDE interfaces on the computer and HDD.




The IDE interface was originally developed for HDDs, but it evolved to include floppy and tape drives, as well as various types of compact disc (CD) and digital video disc drives. A single IDE interface and ribbon can support two devices. In this configuration, one device is designated as primary, or leading, and the other device is designated as secondary, or alternative. In this way, two drives can share the same cable without conflict.

**ATA standards**
When first launched, the ATA interface helped to standardize the original IDE technology introduced by Western Digital and Compaq. Since then, updated versions of the standard have been regularly released to incorporate new and changing technologies.

**ATA-1**
This first standard, which was developed by Western Digital, Compaq and Control Data Corp., introduced 40- and 44-pin connectors and the leading/secondary configuration model. It also defined multiword Direct Memory Access (DMA) mode 0 and Programmed Input/Output (PIO) modes 0, 1 and 2. ATA-1 is now considered obsolete.

**ATA-2**
Also known as Enhanced IDE, ATA-2 added PIO modes 3 and 4 and DMA modes 1 and 2. This version also added support for device types other than HDDs, and it increased transfer rates and storage capacities.

**ATA-3**
This ATA version improved the reliability of high-speed transfers and added Self-Monitoring, Analysis and Reporting Technology. This version also introduced password protection to better control drive access.

**ATA/ATAPI-4**
Also known as Ultra DMA/33, this version added ATA Packet Interface (ATAPI) to the standard, making it possible to support additional device types, such as CD read-only memory drives and tape systems. This version also increased data transfer rates to 33 megabytes per second (MBps), and it added support for an 80-conductor, 40-pin ribbon cable.

**ATA/ATAPI-5**
Also called Ultra ATA/66, this version increased data transfer rates to 66 MBps when used with the 80-conductor cable.

**ATA/ATAPI-6**
This version added support for Ultra DMA/100, which increased data transfer rates to 100 MBps. ATA/ATAPI-6 also included automatic acoustic management, which enabled drives to automatically adjust access speed to reduce running noise.

**ATA/ATAPI-7**
This version incorporated SATA into the standard. SATA supported transfer rates up to 150 MBps and used 7-pin connectors and ribbon cable to connect SATA drives. In addition, ATA/ATAPI-7 increased transfer rates for PATA to 133 MBps. This version also split the standard into three volumes. The first volume defined the register delivered commands that devices use, the second volume focused on PATA and the third volume was concerned with SATA.

## What is the difference between SCSI and ATA?

SCSI (small computer system interface) and ATA (advanced technology attachment) are two standards for connecting storage devices to a computer. Traditionally, ATA was cheaper while SCSI was more powerful, but that simple comparison is no longer valid. Both now feature direct memory access (DMA), which frees the CPU during reads and writes. Both now feature command queuing, which allows the drive to execute instructions out of order. And both now feature hot swappable connectors, which allows drives to be added or removed while the system is turned on.

Both SCSI and ATA were originally parallel interfaces, though recent trends have moved towards Serial Attached SCSI (SAS) and Serial ATA (SATA) as these are much faster. But which is faster between SAS and SATA?

Comparing connectors to judge IO speeds is like comparing two different different processors to judge system performance: there are more factors involved. The speed of a drive depends not only on the connector, but also how quickly the disk spins, how fast the read-write head moves, and how optimized the software is. So while the enterprise and technical computing markets have traditionally used SCSI, buyers may be better served by considering ATA to see if it has a better return-on-investment, particularly for the user's specific requirements.

## SCSI:

Small Computer System Interface (SCSI )is a set of standards for physically connecting and transferring data between computers and peripheral devices. The SCSI standards define commands, protocols, electrical and optical interfaces. SCSI is most commonly used for hard disk drives and tape drives, but it can connect a wide range of other devices, including scanners and CD drives, although not all controllers can handle all devices.

**Recent physical versions of SCSI**—Serial Attached SCSI (SAS), SCSI-over-Fibre Channel Protocol (FCP), and USB Attached SCSI (UAS)—break from the traditional parallel SCSI standards and perform data transfer via serial communications.

Although much of the SCSI documentation talks about the parallel interface, all modern development efforts use serial interfaces. Serial interfaces have a number of advantages over parallel SCSI, including higher data rates, simplified cabling, longer reach, and improved fault isolation.
The primary reason for the shift to serial interfaces is the clock skew issue of high speed parallel

interfaces, which makes the faster variants of parallel SCSI susceptible to problems caused by cabling and termination.

## SCSI Parallel Interface

Internal parallel SCSI cables are usually ribbons, with two or more 50–, 68–, or 80–pin connectors attached. External cables are typically shielded (but may not be), with 50– or 68–pin connectors at each end, depending upon the specific SCSI bus width supported. The 80–pin Single Connector Attachment (SCA) is typically used for hot-pluggable devices

### SCSI connectors

**Centronics 50-pin connector**: The Centronics 50-pin connector was once the most widely used SCSI connector. An external connector only, the Centronics is a SCSI-1 connector that looks the same as the Centronics cable that attaches to a parallel port printer

**High-density 50-pin connector:** The high-density 50-pin connector is used on scanners and Jaz drives. It is one of the more common SCSI connectors and is usually used to connect SCSI-2 devices.
**DB 25-pin connector:** The DB 25-pin or D Sub 25 is by far the most widely used connector. This connector is used for parallel and serial printers in addition to the many other devices available.

**IDC50 connector:** The IDC50 is the most common internal SCSI connector. It is very similar to the standard IDE internal ribbon cable. The IDC50 SCSI cable is considerably wider then an IDE ribbon cable;

**Serial Attached SCSI SFF 8482**: Also called "4x internal" by some vendors. This is a connector with the same form factor as SATA with the addition of a "bump" to key it specifically for SAS.

## IDE vs. SCSI

Today, the majority of computers users are switching from IDE and SCSI to SATA disk drives. However, for users trying to decide between IDE/ATA and SCSI review the below chart for pros and cons on each.

| Topic | ATA/IDE | SCSI |
|---|---|---|
| **Cost** | Overall, IDE is a much cheaper solution. | Compared with IDE, SCSI is often more expensive to implement and support. |

| | | |
|---|---|---|
| **Expansion** | IDE/EIDE allows 2 two devices per channel. Most computers have 2 channels. | SCSI is capable of supporting up to 7 or 15 devices. |
| **Ease** | IDE is commonly an easier product to set up than SCSI. | Configuring SCSI can be more difficult for most users compared to IDE. |
| **Faster** | Today, the latest IDE and SCSI drives running at the same RPM are very close. However, 10,000+ RPM drives are often only available for SCSI. | All the fastest drives are often available for SCSI first and in many cases 10,000+ RPM hard drives are only available as SCSI drives. |
| **Resources** | All motherboards today have an ATA/IDE interface and unless additional drives are needed no additional resources need to be taken. | Unlike IDE, SCSI requires an interface expansion card in most cases (unless the motherboard already has it). Adding any new hardware means more system resources are going to be required. |